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1952 doc 479

UNITED STATES
DEPARTMENT OF THE INTERIOR

DI-6

APPROVED DECEMBER 1941

K.M. Waage NOTE BOOK 8 1952

CONTENTS

Canon City area

Garbage Gulch SECTION 1.
Sand Creek section NOTES 7.
Oil Creek section NOTES 9.
Skyline hogback NOTES 11.
Sullivan Park area NOTES 13.
Denver Fire clay, N. Golden Mine 15.
Golden Fire Brick Co. mine 17.
Johnson mine - note on fault 20.
AIN-51-24(L) notes and clay siding of D+RGW, section 21.
AIN-51-27(L) notes 26
Arkins area + Carter Lake dam road-notes 27
Little Thompson - Lytle section 28
Alameda Hwy cut - BENTONITES + partial section = Alameda #4 31
6553
Alameda Disconformity N. Alameda cut 35
AIN-51-28 37
AIN-1B-178 42
AIN-51-24 43

1954 with Bass
Spring Canyon
Bear Creek
Deadman Canyon

44

Grape Creek. section - 1½ mi SW Green City

Geology: Gulrich

From bottom up, starting at top of pink-gray fine grained flaggy sandstone of Mt. Mackrison.

A.	30.0'	Obscured, probably vertically jointed sandstone
B.	9.8	Vertically jointed gray and red and green clay
C.	11.0	Interbedded brick red micaceous clay stone & sandstone, argillaceous and some silty clay
D.	16.2	Banded, fine grained massive x-bedded, light gray, to yellow brown with [illegible] argillaceous siltstone and shale in upper part. Lower part grades into platy, flaggy, locally gritty massive [illegible] Base not exposed in creek bed.

Unconformity

1 E	70.8	Sandstone, massive x bedded, conglomeratic, beds rel. uniform 35°. Chiefly fine to medium brn weath., tabular x-lam to x-bedded. Breakdown

Base

2.0	Conglom & sgl. ss.
23.0	Sandstone-fine-med-local coarse stringers, and scattered [illegible] pebbles
13.3	Coarse [illegible] with [illegible] pebbles

1.

1.9
4.2
.25
6.6

15.4
17.1
32.5

1.5
0.6
0.7
1.0
3.8

1.7
1.8
3.4
~~6.9~~
7.0

32.0
13.3
23.0
2.0
70.8

and cobbles in lower 8'. up to 0.4 diam, chert & qtzt. perm.

32.5 Fine to med gr. x bedded, clayey massive.

Disconformity

F 0.1–0.4 Cglom. plastered on sou[illegible] underlying ss, not cut[illegible] a discreet bed. Coarse, pebbles up to 0.2, chert & qtzite.

G. 3.8 Sandstone, fine-grained, [illegible] argill, in beds ± 1.0, weak, o-brn, mod spletcher

H 7.0 Interbedded [illegible] areous slabby to shaly grey siltstone and silty clst grey to black sha[illegible] Light-colored beds as follows From base

(a) 1.7 [illegible] grey to grey wit[illegible] white specks = 0.1±

(b) 3.5 [illegible] 0.2 to 0.3 light-brown to olive grey sooty real & clay

(c) top of bed locally 0.2–0.3 brittle lighter white to greyish fine gr porcel[illegible] d.

I 10.8 Sandstone, fine gr. massive to irreg. bedded, worm tubes, mixed-structure, argill-[illegible]

5.3
.1
4.4

4.4
.9
4.4
3.0
4.0
1
4.7

22.4

mixed throughout.

J.	6.6	Platy, silty ss. to sltst, fine gr in beds up to 0.8'. Shot with very [illegible] tubes or trails, ou[illegible] ripple marked
K	4.7	Siltstone, argillaceous, p'ly with some zones dk gr to bl. silty shale. Laterally becomes more shaley – also thinner as bottom rises. Grades into J below.
L	1.0	Ledge silty fine gr ss, well Ec vo in very coarse + sub is somewhat argill.
M	4.0	Shale, blackish fissile, with thin layers of s.lt. Basal 1.5 chiefly argill. silty with sh. interbeds, upper 2.5 sh.
N.	3.0	Interbedded dk sh, light gr thin beds siltstone, and scattered brown weath. argill, silty, fine gr ss & sndy siltstn (x-lam)
O.	4.4	Shale, dk grey to black, silty with interbeds, thin siltstone.
P.	0.9	Sandstn ledge, fine gr-silty argillaceous

Q	4.4	Interbedded silty gray shale and siltstone, latter increase in number and thickness upward. and become finely sandy, grade into next (R) interval
R.	4.4	Sandy siltstone + siltstone, evgillic in crumbling ledges. light gray with fine clay + pink stain, some interbed. silty shale.
S.	4.3	Dk gray shale becoming silty above lower 1.3 and grading to shaly siltstone to ~~siltstone~~ fine, evgillic. Thin bentonitic clay 0.5 above base. This shale grades down to red creek bed to czrbk silty clstn, & siltstn. Bentonite gets gypsic.
T	6.3	Sandstone, fine gr, loc. evgill. but becoming less so upward.
Unconformity.		
U.	11.4	Sandstone, massive fine to med. with coarse grained lm lower 3'. & 1zm, brown weath. Local rusty zones where plants or clay weathered out.

Discont.?

W. 0.5 ft l.u Sandstone, fine gr in thin beds with thin silty shale interbeds. Local ripple cut

Uncert.

X 3.8 Sandstone fine to coarse, less of latter in finer, locally contains clay frags

Y 45.0 Sandstone, [illegible], tabular, X-lam, fine to med, few coarse grains in lower part, bioturb, weathering

[U, W. K.] fauna [illegible] Sinuclei]

Z. 8.0 Interbedded sandstone and argillaceous siltstone. Thin beds, platy, sl. wavy up to 1.0. Contains burrows on platy bedding planes. Carb shaly siltst interbeds. Sl. resp. brn weathering. Top SS is dk fe impreg, ripplemarked surface.

AA. 9.3 Interbedded dk grey shaly argill. siltstone

1.5 [illegible] with 0.3 silty bands

3.1 Chert siltstone, locally with lt. shale

0.2 Bent. cl.

0.2 Argill. silt.

0.1 Bent.

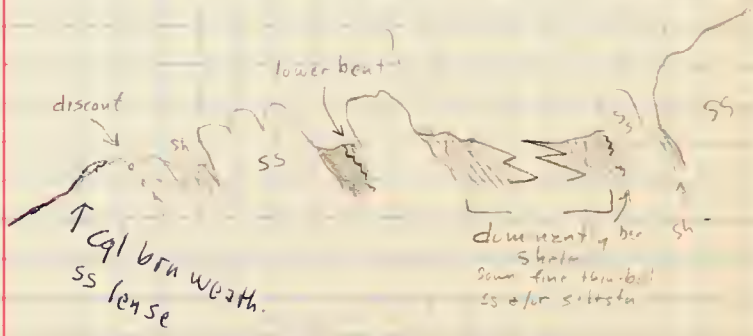
2.9 Platy argil. siltst

with .9 sh at top.
0.1 Bent,-
0.7 0.3 sh. then. 0.4 sh. arg.ll
plsty
0.2 bent,
0.3 Silt st. as below
Slope. wash-

Sand Creek section:- notes

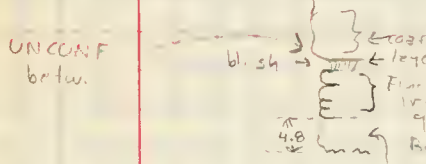
Bob Carpenter will send it. Where section measured in draw only a foot or so of typical Lytle, but up ridge to N, it thickens to at least 10'. However, it was difficult to spot disconformity up ridge as the shale just above it lensed out up dip bringing base of ss above it into contact with base of Glenrock s.s. Thus Lytle upper lens appears continuous up into Glenrock locally. S of draw, and on it, the calc ss above uncon can be found, though it is not as clear cut as at Skyline or Garbage gulch.

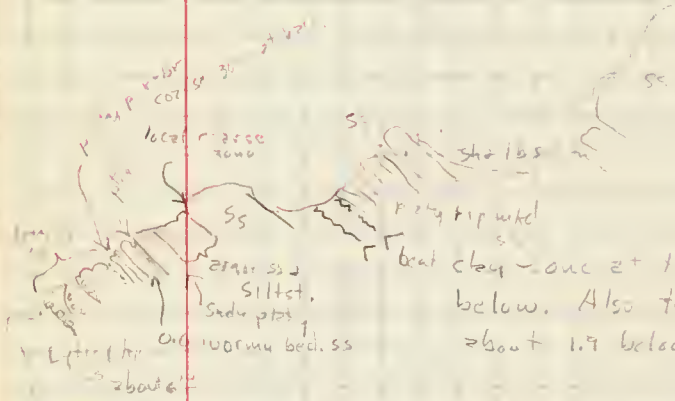
Only 3 Benton-like beds seen in Sand Cr. section, one thin one near top and other in top ft. s.s. next above bottom Glen s.s. One near discont.



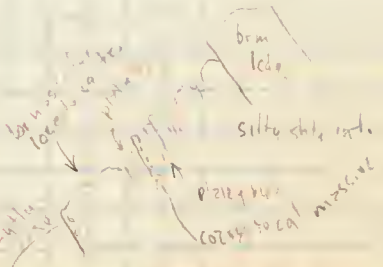
Sand Cr, cont'd

Base of massive x-bedded SS




local coarse zone
SS
sandy SS + Siltst, Sandy ptgs
worm bed. ss
about 6'
shales
bent clay
bent clay - one 2' top and one 3ft below. Also trace lacr one about 1.9 below next above.

above on slope to N.

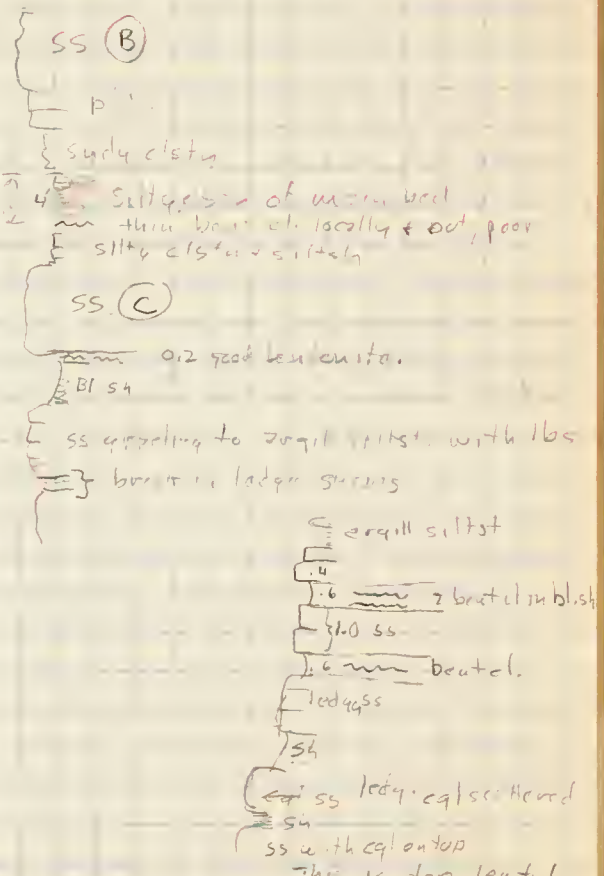


Oil Creek Section, notes.

Glauconitic sandier than at Grape Creek areas. "Skyline" lentil present. Measured section from Bob Carpenter. Details of some of beds on section:- 7 on E side Cr- Bob. section N

Oil Creek cont.,

p.s.s. section first N. of mouth oil cr. thru. Utah.



Skyline Hogback - notes

Recheck of section for bentonites shows that one at base of main clay - Taylor/Wagon section 1951 is not well enough defined to be counted. May only be stained plastic clay. However on S on hogback, vic. clay mines the exposed clay bed does have a bentonitic layer 3.5 above base. This clay was measured and sampled in summer 1949 with Colton Belden, etc crew from field course. This year trace of the middle bent. zone seen at several places where Taylor/Wagon section taken.

Discontormity:- There is definitely one over the x-bedded fine to cgl, brown weath. ss with lenses gray shale that overlies more typical Lytle-type coarse to cgl. white ss. Contact between this brown-ss unit and typical Lytle is not sharp here, as it is along Grape Creek, but change takes place in mixed zone indicative some reworking of underlying light grey Lytle-like ss. Locally fairly sharp contact featuring some concent. cgl in base brown lense. The

* - Fracture - see this along 2nd Glenrose

S also bentonite at base of the brn weath. cgl. loses you've put in Lytle KW 1954

Glencairn - Lytle discont. should come at top under the cgl. bed. The brown lense resembles Glen. ss except it is much less regularly bedded than usual, and is calc (though not to quite as much) - not just in basal phase of thick channel-fills like Glencairn ss - but in scattered x-bedded layers as well. Because this lense is thickest on Grape Cr. hogback - as far as I've seen it, it could be called Grape Cr. lentil - though styling isn't ok.

Fossil abundances of clay mine Inoceramus sp found just above bentonite in first shale under clay bed, as far as can be told at that place. Would be as indicated in section.

Sullivan Park - SW entrance

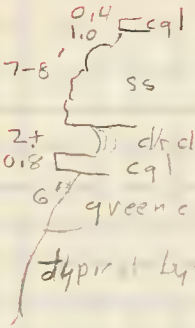
The Skyline member here,
[illegible] Sandstone [illegible]
0.8 Coarse to vcg ss, ltbr, [illegible]
[illegible] obscure, friable ss? few mm thick layers
Unconf. 25.0 Skyline - coarse [illegible]
5.5 Lytle-like lith.
Green clays and [illegible] at least 30'

The Skyline tends to [illegible] and at contact with Lytle-like lith. shows scattered quartz pebbles on surface [illegible] top [illegible] the Skyline [illegible]

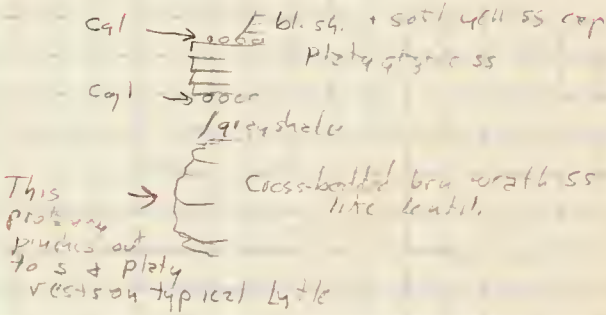
McConnell Ranch entrance.

Skyline member in, is about 10 ft, varies as it is channeling. Above it is dark gr-bl clay zone. 3 to 4', then hard ss with coarse cgl in basal 4 to 6" — Even bedded qtzite above. S on Turkey Cr, the lentil either thins or pinches out + cgl in overlies the more Lytle like beds in places. [illegible] of cgl. 2 beds cgl further along to S and lentil lies between.

13.



Rotate at McConnell ranch shows



Drawer fine clay - top marked

Mine | Clay bed up

Clay

5.6	L.B. siltstone fine ss, shale partings & thin beds.
2.9	Silty claystone with dk gray, & small silt. Silt lodge ou e .9 from base
1.3	Siltstone fine ss, small streak
2.4	Dk gray fine silty clay
2.0	Sandstone, fine gr X-bed
3.5	Dk gray clstn & argill. siltstn zone .6 ss 1.0 from top Sandy lenses above
5.9	Sandstone, fine gr, gray some small & dark micas
1.0	Dk gray silty shale
4.7	Sandstone, tabular X-bed fine gr Argill. partings, some beds dense
9.3	Sandstone, fine gr X-bed, dense ss
1.7	Alt beds dk gray silty and ss, in upper ½ dk gray silty shale
6.2	Fine gr ss grading upward into coal irreg beds fine ss & silt with small melter 1.0 of silty sh. at top.
12.4	Sandstone fine to med gr. upper 9.3 calcitic ss

Top Dakota

5.7 Argill. silt.sh. fine ss, 0.6 zone
base to base unit. 0.1 with 0.3
shale at top. Mica fine sd. lam.
grading to argill. silt. Sharp
is siltstone. Fault at base unit in
over shale slop. Fossiliferous

6.2 Base unit.

7.0 Transition zone - thin bedded
to interlaminated sl. silty sh and
massive argill. siltstone.

— — Grades shale

Vein under [illegible] 27½° [illegible]
Elmer Rouse.

Golden Mine at Newell Hoy vacity - below exercised
Aug. 1952. Clay bed up to 25'.
according to Muller (Rouse says 15 ft.)
Clay 40, 14' miner

From top of clay bed up.

A	2.6	At base .6 sandy [illegible] the [illegible] silty shale [illegible] fine sand [illegible] laminae
B	4.5	Dk gray argill. [illegible] silty clay with some [illegible]
C	1.5	Sandy [illegible] gr. white
D	1.5	Dk gray silty clay & argill. siltstone.
E	1.3	Argill. silt, dk gray
F.	2.3	As in D
G	1.2	As in E
H.	1.6	As in D
I	3.3	Sandstone, fine gr, top with [illegible]
J	2.5	Argill dk gr siltst & hard silty claystone. massive.
K	1.7	Thin bedded to laminated dk silty shale with thin beds fine ss & silt laminae
L	6.5	Sandstone, fine grained, some

Blue Jean

17.

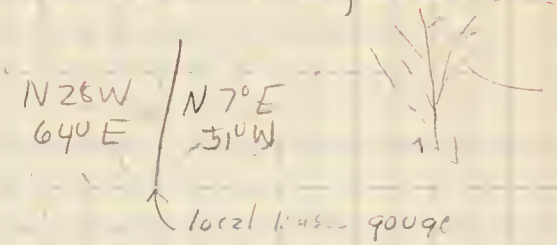
scattered carbonaceous matter

M	1.1	Blk silty shale clayr
N	5.6	Even/sl to irreg bed[illegible] interbd sh & carb. mass of sh
~~O~~	~~0.7~~	
O	0.7	Dk shale, sl. [illegible]
P	3.7	Sandstone, fine [illegible] with [illegible]
	~~0.4~~	incrs carb. [illegible]
Q	0.[illegible]	Dk silty sh.
R	0.9	As in P
S	0.2	As in Q
T	0.9	As in P
U	0.6	As in Q
V	1.4	[illegible] grading to W
W	1.1	Blk-dk sh silt laminae
X	3.6	Ss [illegible] as in P. worm tube [illegible] partings & thin beds sh increasing upward carb rich [illegible]
Y	2.9	Irreg bed lenses silty sh & clay [illegible] with siltstone laminae
Z	4.2	Fine gr wh. ss, soft, carb [illegible] ptings
AA	1.7	Sh, [illegible] zone worn worked with ss blebs & thin lenses lt gr & wh with white ss
BB	1.7	Beds white ss partings carbs,
CC	2.0	As in AA
DD	0.3	Bentonite (Sample 1)

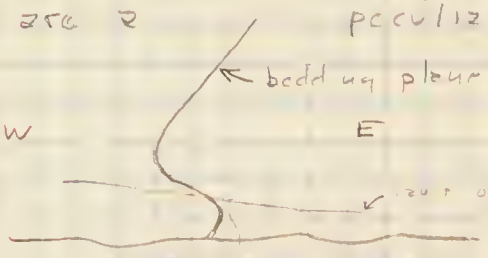
EE	6.8	Interbedded silty sh, wood, silt sh, sandy lmst, sandy lmst, thin ss, silty lmst, coal, coal, coaly sh.
FF.	0.2	Bentonite
GG.	7.4	Transition zone interbedded hard bl silty sh and silty, dense, hard bl argill. Minor sandy zone.
HH		Greenish - soft bl. sh.

Johnson Mine

Haulage way N. 73° E. from entry
taped 228' to entry



Minor faults roughly ⊥ entry floor
area ?



The fault is between Graneros & Greenhorn. Throw can't be determined. At mine entry is 1.0± bentonite with fossiliferous lime shale above. Inoceramus fragments look like Inoceramus labiatus but not positively. Either high in Graneros or local Greenhorn equivalent at entry.

A.N-5-24 Tape

Bentonite

Bentonite contact (see Kch=1 roll 3)

Shots 2 & 3 show 2) channel bar & tape marking
clays 3) I.B. staff & scale at Dat- shows
bentonite in transition clays
4) Jacob's staff.

Section proceeds south from top of hill
going down.

Hdg. [illegible] N27°W, 38° dip

A — Generous shale, greenish gray plastic
quartzite weathers light, some silty zones.

B. 2.0 Siltstone. Argillaceous, locally thin
platy gray silty clay in middle.
Wet Fe brn weath.

C 0.1 Bentonite

D 0.6 Brn & gray siltstone with
interbedded [illegible] and lam
brn sandstone at base.

E. 6.1 Shale, [illegible] can be [illegible] discontinuous
in part
& shale, gray w/ [illegible] & [illegible]
Limestone and [illegible]
Lenticular zone.

F 0.1 Bentonite

G. 1.7 Interbedded shale, gray weathering
and thin layer bentonite

H. 0.4 Bentonite

I 3.0 Siltstone as in G. with [illegible] lodes
at top

J. 0.8 Chalcedonic sandstone, [illegible] weathers, white,

21

O
N

Beaten

and purple, ~~scat~~ 2 or 3 thin red s to aver.

Splotter Contact, K. 0.6 Sandstone ... cap on unit L. Lavender, fine F, impreg ss with scattered chert + qtzite pebbles to 3/4 cm.

L 7.3 Sandstone, fine gr, dense, massive, weathers yellow to yellow brown. Lower ... vuggy. Sand ... very ... tops.

M. 2.2 Thinly silty shale, weathers green-gray, with thin interbeds ... and thin ... ripples.

N. 6.8 Sandstone, ... to that in L but ... Beds ... to 3.0 thick with ... Shale ... parting.

N. 30.0± Log ... Channel ... showing ... variation in ... ss ... At spot ... measured at ... of ... 2.0+ and ... Lower 23± ... next flat ... this ... but ... ss.

Section-Wash

O. Last ... to cut out by ... 23' ... N is ... Cuts in laterally to S ... cut.

P.	2.1	Shale, silty gray shale fe stain th lower fz, upper silty dk gray shale with sm: fine, lens of 0.6 d [illegible]
Q	4.5	Sandstone, fine gr[illegible], lt gy, rr ss' bl[illegible] x lams
R	1.1	Shale, gray [illegible], sl silty w/ bentonite cage
S	0.4	Si[illegible], gy, argill, brown [illegible]
T	1.7	Clay, [illegible] gray, silty, dk sh [illegible]
U	3.2	Ly cr bed f[illegible] si sl silty [illegible] Fe bnd weath at top to 1.0, and silty brn [illegible] Bentonite 1.3 up from base
V.	0 to 0.5	Dk gray [illegible] shale with thin ryer sandstone at top (locally cut out in places)
W.	3.4	Base 0.3 to 0.6 is red clay Fe stained, [illegible] 2.1 gray to olive gy silty clay. Remainder above is blocky to flaking light gray weathering silty clay & argillaceous with yellow red stain
X.	0.6	Fine ss [illegible] with Fe bnd
Y.	3.2	Dk gray to blk silty clay blocky, fracture Some argill siltstone in lower part
Z.	1.5	F[illegible] ss [illegible] silty, similar to [illegible]
AA	1.0	Silty clay as in Y.
BB	0.4	Bentonitic clay, grades to ~~arg~~ Si argill s[illegible]

CC.	5.0.	Lacustrine ss as in Xcvz which includes silty blue gray clay & argill. siltstone. A loose dev. zone 0.8 from top.
DD.	16.6	Main coal Upp 4.0 contains beds and lenses of sil. shale, 0.2 of bentonite at base
EE	7.4	Partially obscured - zone of interbd silt, clay and bd. siltst. Abt 0.8 crumbly fri. sd in irr. lenses throughout zone. Argill. siltst & silty clay down with 0.4 ± 0.1 sand, argill siltst at base, above is 1.0 ± ss lens with possible silty bed in the clay 0.3 ± 0.1 bonezle. The clay in main body is silty gray plastic to ... plastic.
FF	1.1.0	Gray to brown ... gray silty plastic clay, some sil. interbedded silty in upper part. Possibly few thin ss beds in lower 2.0. To main coal bed. Coal in this zone only few feet thick. This zone (FF) represents ...
GG.	8.6	Interbedded fine to ... ss.

S Sandstone. 2nd silty cl + S. in ~
fraction 1mm to 2.0, increases
in coarseness downward. Clay coated
obscures

Grass roots at cut

H,H 14/10 [illegible]

I 15.0 [illegible]

AIM-51-27

(1) L: N 1° W, 53° W adjusted
N 13° W, 45° W "
Hillocks on Nicholson Is. Horizontal exposed
for ~~2 feet~~ shore [illegible]

(2) NS W, 35°. On [illegible]

(3) Massive [illegible] coal
specimens. Morrison 11° W. Highlines.
.1 E W, 35°
(21° is [illegible])

(4) Limestone [illegible] N 13 W, 52° E
(5) Bands [illegible] white [illegible]
Morrison N. 16 W, [illegible]

(6) Sandstone [illegible] (5) zone, [illegible]
[illegible], N 17° E.

(7) Sandstone [illegible]
contact - N 14° E, 52°

(8) Fissures. Dip 42° [illegible]

Arkins area.

The lower part of the section all along the hogback east of Arkins consists of a lower, generally calitic sandstone ledge overlain by as much as 30 ft of variegated clay; this interval has another ss over it and locally 3rd ss in contact with it — discontinuity locally visible for ½ mile or more. (See headed home on Johns camera)

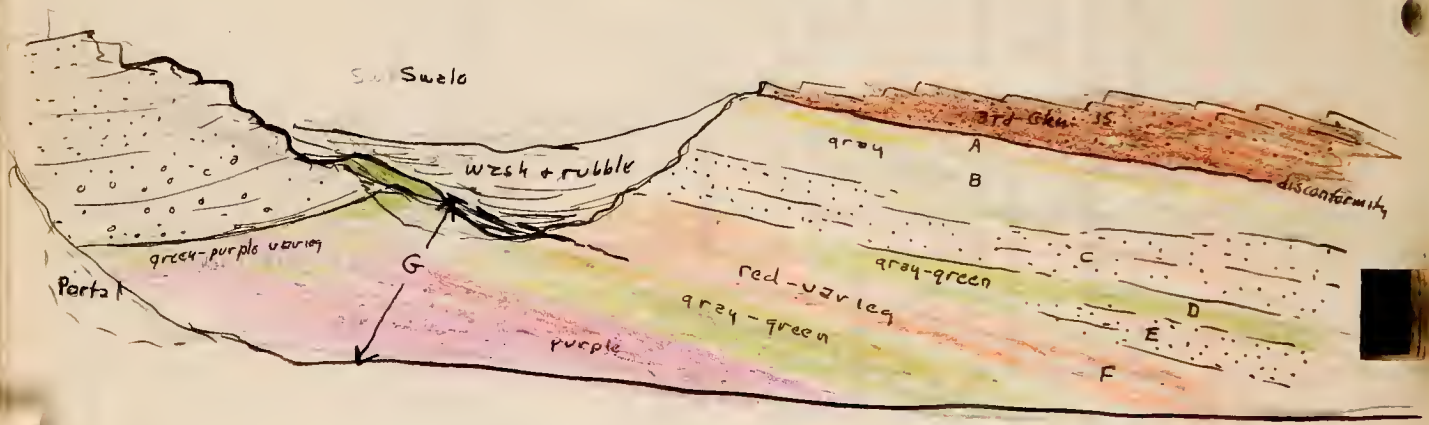
Near plaster mill abandoned clay plant once used either Dakota clay or Benton — no one around.

Carter Lake — Road to main (S.) dam. Sample 1, is siltstone between 2nd 1.5 beneath disconf. at base 3rd ss, Sample 2 between 1.5 and 2.5 of same.

[illegible] of cut to portal — not to scale [illegible] wash

looking N.

See [illegible] for section



Little Thompson Lythe section.

Thickness of 3rd SS variable. Probably is between 20 and 30 ft over most of this area. Conspicuously evenbedded, brown-weathering. Forms long dip slopes on flanks of structures. Almost completely covers Pebbit Mt in vicinity of tunnel.

At east portal of 'siphon tunnel' a remarkably variable section of the Lyth is exposed. Measurement difficult owing to the variability and slope on cut.

Surface of hill

25'± Sandstone (3rd) evenbedded, brown weathering, fine-grained. Worm tubes ⊥ and some truncated bedding planes.

Disconformity

A.	2.0 to 3.0	Argillaceous Siltstone, yellow weathering grades to unit below.
B.	17.0	Argillaceous Siltstone and silty claystone, light grey to grey with greenish cast. Stains yellowish brown to rusty [illegible] on weathering.
C.	7.5 to 8.0	Sandstone, fine to medium grained

massive, light gray, x bedded. Weaths Fe brown on joint planes.
This unit thickens laterally at expense of overlying siltstone. At one point is about 20.0 ft

D. 7.0 Interbedded fine gr. ss. and silty greenish gray clay. [Sample 1 from green clay] laterally clays thin + ss beds coalesce and to W ss thins out and interval is mainly clay.

E. 7.0 Sandstone as in C. Weathers cut it lenses out into variegated red + green clay + argill siltstone. Thick resembles main 5 sect. of portal and thickens to join ss lens. (see G.) at portal.

F. 14.0 Clay~~stone~~, silty + argill siltstone thickly red (about 5R 4/4).

G. At level 20' exposed —
Green argill siltstone + silty clay with yellow stain — occupies upper 5' to 6 ft where no ss present - grades into red and purple beds in lower 5.0 + [color of latter varies, ranges from 5RP 4/2 and 10 P 4/2* to 5RP 3/2 and 10P* 3/2 — splotched with irreg red clay 5R 4/2 and 5R 3/2.] Greys to dusty purple and red purple, with

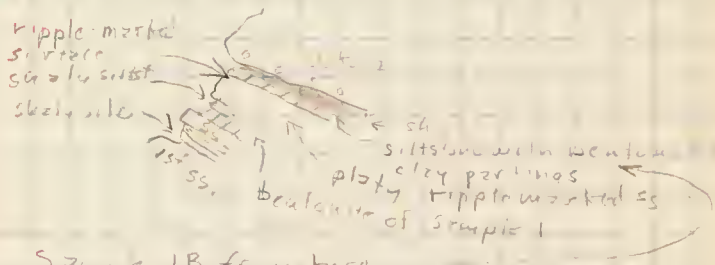
* Value not recorded from chart as between 5P + 5RP

splotches of greyish to dusky red.]

Laterally, at the tunnel portal a lense of sugary, fine to coarse + calcic sandstone comes in, Appears to start at top of this interval in greenish beds and cut downward. At same place ±, ss at E comes in and at portal F seems to be pinched out by coalescing ss. The lense of ss at portal is 15'± thick and thickening into hill (Reclamation in Loveland has the drill logs on the Lytle access Road Mt.)
ss rests on green and greyish purple beds at tunnel portal
[Sample 2 is of green immed. below base of lense.]

Alameda highway cut.

Alameda bentonites — Sample 1. Base main clay (where ft of ft.). Atypical — 2. Soft bentonite deposited to thickness as much as 2 in cor. ½ cross-ripples area where intersect by creeks — mud as 3' ft. out.
May be 2 bentonites here separated by silty sh. — Possible upper is ¼ top of bed.



Sample 1B from here

Sample 2. — Bentonite at top of the second shale

Sample 3. — Bentonite under cap of 2nd ss.

Sample 4. — Bentonitic clay? 1.5' und. Sample 3 in 2nd ss.

Sample 5 — Bentonitic clay — near base 2nd ss on top 3rd sh.

Sample 6 — Bent clay in lower part 3rd sh.

Arauca 2 (cont.) Partial section to locate bentonites.

Base first ss.

A	0.9	Dk gr to bl shale, silt laminae thin weather Fe st.
B	0.2	Bentonite [sample 2] second key marker. ★
C	0.8	Dk grey to bl sh. as above.
D	2.2	Platy zone. Thin silt ss with some shaly partings
E	2.2	Interbedded grey sh, shaly siltst. and some platy beds. Grades into F above but is more shaly. Lower 0.3 silty, platy.
F	1.2.	Thin bd, loc. silty massive, light grey, mod. weathered. Carb nodules.
G	0.1	Bentonite [Sample 3]
H	1.6	Sandstone as in F above
I	0.1-0.2	Bentonitic clay [Sample 4]
J	12.6	Sandstone as in F, with local thin beds of shale and platy siltst.
K	11.8	As above but more siltstone to ss, higher carb & ironstain content - as lt grey laminae mixed by worm working? Fe "bands" increasingly common clay, shale.
L	0.6	Dk grey shale, silty, with bentonite in lower 0.2 [Sample 5]

Sam. of ss.

M	2.2	Siltstone, dk gray, zvgl.-crvb, [illegible] shaly zvgll. + some silty sh. An 0.1 cap of Fe stn. impreg calc at top. All worm-worked + simulate K, the more zvgll.
N	5.0	Chiefly siltstone as in M but fewer zvgll zones
O.	2.0	Dk gray to shaly zvgll siltst + silty sh.
P	2.3	Argill [illegible] silty shale. [illegible] Dk gr. Imp fossil 0.6 to 1.0 [illegible] Izmirae give shaly platy struc [illegible] structure disrupted by worm work so that upper part of bed is mixed siltstone + remnant [illegible]
Q.	0.2	Brachiopods. [Sample o]
R.	3.4	Platy [illegible] shaly, silty [illegible] silt. Most [illegible] 1.0. Scattered [illegible] worm. Loc. K = A.
S.	18.2	[Third ss] Even bedded K [illegible] gr. ss. [illegible] [illegible] ss [illegible], gr [illegible] pebbles [illegible] to fizbuk

		but ss silt contact is sharp. Lowers 1.8 platy to shaly.
T	2.4	Siltstone, massive, light grey weathers, but fresh is brn-grey. Showing fine plant traces, coarser below, where rush-like prints common. Grades to intercal below.
U.	1.1	Liquitic silty clay with local bentonitic zone [Sample 8] in middle (up to 0.2)
V	0.2	Silty grey bentonite [Sample 7]
W	1.9	Silty brown-grey shaly clay with carb plant traces.
X	1.2	Fine gr SS & siltstone mass w/ loc. porous carb fr. zone
		thruout
		Fine SS

Slump obscures below this.

Alameda #3

Alameda – Study of cut at Shore Alameda Highway – bc ucc cut and intersection with Morrison road.

Base [illegible] SS

3.0 [illegible]

2.8 Sandstone, fine gr. = X c [illegible]

2.0 Shaly sandstone, dk grey, c-sc.

8.3 Sandstone, fine gr. [illegible] with [illegible] zones, with [illegible] 0.4± bed [illegible] ch pebbles up to c-sc

Discontinuity

3.7 Argillaceous siltstone + silty [illegible] quartz, yellow to [illegible], some grey [Sample 1]

3.0 Clay, silty, [illegible] pebbles. [Sample 2] chert + grey, w [illegible] + some pebbles.

1.0± Sandstone, pebbly, impure [illegible] fg - med with pebbly grey [illegible]

2.3 Clay, silty grading down to sandy with [illegible] sandstone), yellow to [illegible] clay (latter [illegible])

Fc impure SS as above.

Slope [illegible] – [illegible] grey clay + Fc ss for about 10 ft red clay [illegible] weathering to grey. [illegible] end [illegible]

35

below 1st it is 32.5 feet to
top of first measure

AIN-51-78

17. 3rd shale becoming shalier, and upper part ?or lower part 2nd ss more platy — probable that platy top 2nd base of 2nd ss = the 2 fossiliferous zones farther north

18. N 1°W, 43°E on base marker by. Main bed is 18 feet thick plus in this area. Iron gone about 10' from base. Basal bentonite and ripple marked ss.

19 Partial section of clay complex.

Top 12'+ of 2nd ss is thin well bedded reservoir unlike 1st ss. Section started at top of this ss. Surface locally grossly ripple marked — 6" crests. (See Helmer mine sec. for similar set up and bed. ch.

Top 2nd ss. on up

4.2 Platy zone fine platy ss + siltst, with interbedded sh + silt.

8.1 Shale, siltsh + ss interbedded near base, becomes siltst throughout 0.2 bentonite at top. (2nd sh.

7.4 Sandstone, massive to tabular, fine gr. (1st ss)

16.7 Good plant fossils. Silty clay + siltst, dark gray to black. Thin interbeds silt ch at base in lower part. Also

argillaceous siltstone. This is "blue silica vein" - or "lower split" Most shale in upper 4' [Sample 1] below this it is argill siltstone.

3.5 · Ledge of hard massive to even bedded, siltstone & very fine ss, local argill zones & minor ~~argill~~ ~~beds~~ ~~ing~~ clstn.

1.7 Silty shaly clstn & argill. siltstn

0.7 Dense somewhat argillaceous gray siltstn.

3.0 Bl. silty clstn in lower 1.5 upper part shaly siltstn with interbedded siltstn.

2.3 Sandstone, massive hard fine gr. ripple marked upper surface

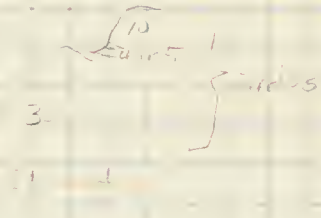
Main clay with gratonite at base - 18 - 22' [illegible].

Note on first Gicu ss - Remains distinct most [illegible] up ridge N to 15) where it is about 15' thick. Top zone also a ledge.

3rd ss is double ledge in groove over between 19 and (15) upper bench about 10' 7 soft shale then 25' lower ledge

Discont between 19 & 15 [illegible] 3 to 4' [illegible] on top of it [illegible]

sandy, poorly developed - most, shiz'y
platy ss



Base of Lail - obscure.

red clastic mix ss

Spicy ss
some intrusive eql

yiby grade

Rockville

Ist clay under ss of Rockville.
brn clay at base
one pebbly band
enc.

Pictured

AIN-51-28 (8)

Local thick lense of lower split, Coors property south of Ralston Res.
Meas. at the best point.

Top 1st Ohlson sand up

2.6 to 3.0	—	Platy to shaley siltstone, minor
11.6	—	Silty shale bl, grading to Bugill siltst. near base. Sample top 4'
2.8	—	lower 1.8± siltstone, light gray weathy, above this 1 to 1.5 of dk gray shale with silty Fe oxide zone flaky (bent?) clay in lower 0.3.
2.0		Sandstone, fine gr. massive, br. weath
5.0	—	Interbed of silty gray sh and siltstone, ~~brn~~
24.0		basal 0.6 gray siltst. le thin 0.05 brn 0.2 bl sh 0.3 sltst The silty sh to ltl 3' from top where gray silt shaly layers
1.4		Sandstone, brn. weath. ripmarked top
0.1		Bentonite
1.2		Dk gr to bl silty sh + thin layers siltst. 0.1 to 0.2 white siltsty layer a top
8.4		Dk gray clay

Total L. Split

Pb Ohlson Sandstone

Mt

6.6 Dk gr sandy clay, 1.0 to 1.5
Fe stone + platy Fe shale at
base
ss capr. then wash,

Plainview – Elaine?

AIM - IB - 178

1 ① Bulldozed trench in base of Benton shale and transition bed to Dakota.

② Bulldozer cuts in swales for access between western hole probably 2nd SS and is west of it the 2nd. Eastern hole probably on main clay bed.

③ Clay in dozer trench with basal base + silty/plastic cl. SS ledges on either side (LW) marked by pins... Wot SS above cl is very plastic clay prob not in place.

AIN-51-24 - Classification

(2) Calcareous siltstone; weathers yellow gray, with some fragmental veg. [illegible] oysters, pecelypods - Hap [illegible] is 8" [illegible] 3'8" ± thick. Well cyclic graded [illegible] N 35° W, 65° W [illegible]

(3) Pierre shale, vertical to steep eastern dip. Fossils from mid of cut

(4) Very coarse cut gravel calc. [illegible]

(5) Micaceous [illegible] speckled finely calcitic ss with rinds - lics 2 ft 20-25 ft [illegible] (-fossil) calc [illegible]

(6) A [illegible] like ss - like a [illegible] wall below cut & is petroglyph by some soft stuff - it weathers siltstone but doesn't look it.

(7) Thin, lenticular - light, some clay, [illegible] to finely calcitic red soil on slope just [illegible]

x Red soil zone

(9) Massive calc. coarse.

(10) Discord.? a thin calcitic brown weathering ss on [illegible]

(11) Green clay & calc. weathers silt. typical of Green [illegible]

(12) c Sandstone. massive x bed weather pink with pits ½-¾ diam average locally coarse. continues for sm. distance

(13) Light gr. calcitic ss.

(14) Double is bar with shale below. At top (strat.) of shale is light streak [here too weathered to see true nature] may be bentonite. at top 2nd sh.

(15) 3rd ss, at least part of it

(16) White cuttle-like ss as at 10 and 6

6/22/54 | With Bass + Frank

Pictures — Showing shaly beds equiv. to Kassler in Spring Canyon cut. with Frank standing on ~~Red~~ key marker, one on possible 1st Ca gypsiferous zone.

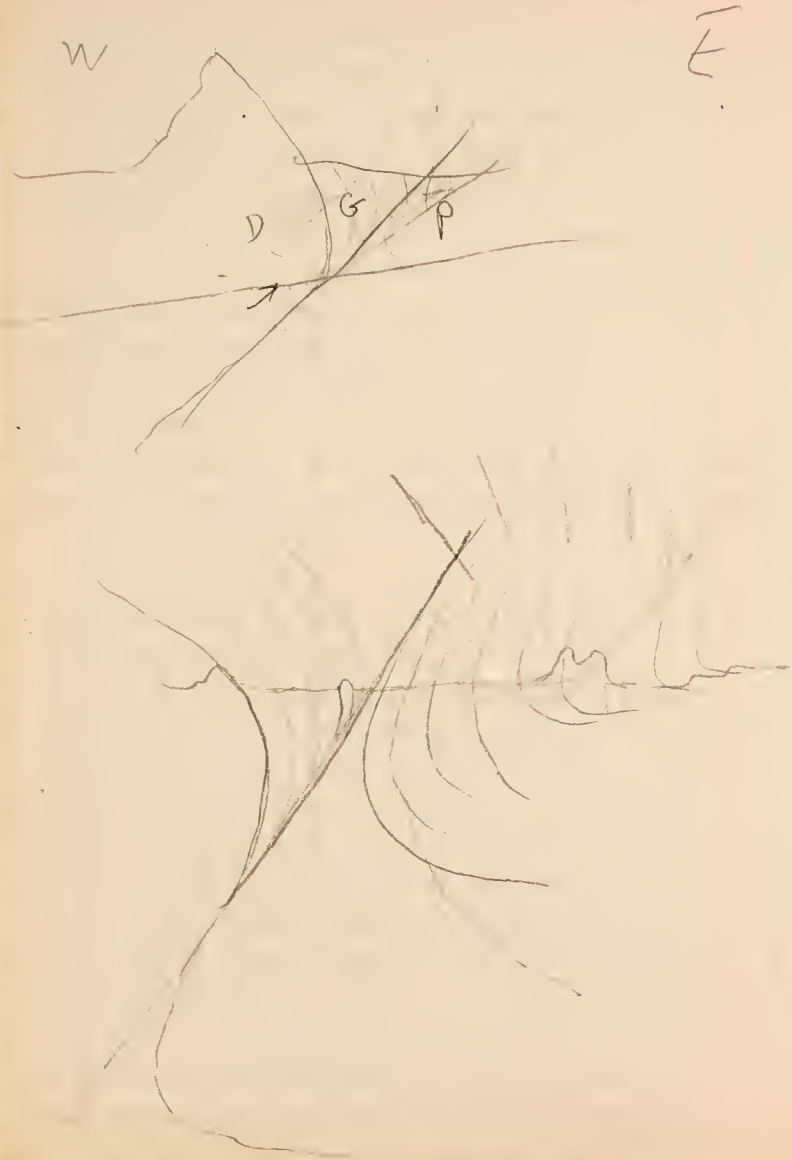
6/24/54 | Canon City trip with Bass

Bear Creek section — Clay break in between top sandstone. Has ripple marked bed on 1st top lower ss.

Lytle cgl. in local lens thinning to W + S.

At Dexter Canyon — A thin bentonite-like clay rests on Kassler equivalent, may be 15 ft in meter. This is bad outcrop where this type of section between the 2 sandstones — assumption is that this clay = Dry Creek Canyon member but this needs proof by tracing through Camp Carson area.

[4+]


W
E
D
G
P

Mrs. Chas. B. Mills [3] =
1225 Grant. (Kstn 6585)

David L Thomas
365 [illegible] Blvd (4[illegible]) [illegible])

Norm - Belmont 3-5476
Gotham 34409